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L1: Entry 2 of 7

File: USPT

Feb 3, 1998

US-PAT-NO: 5714168

DOCUMENT-IDENTIFIER: US 5714168 A

TITLE: Method for increasing flowability of spray dried vitamin powders having low vitamin concentrations

DATE-ISSUED: February 3, 1998

## INVENTOR-INFORMATION:

| NAME                 | CITY      | STATE | ZIP CODE | COUNTRY |
|----------------------|-----------|-------|----------|---------|
| Stroh; Friedemann H. | Southgate | MI    |          |         |
| Lisa; Rudolph E.     | Gross Ile | MI    |          |         |

US-CL-CURRENT: [424/490](#); [424/458](#), [424/461](#), [424/479](#), [424/493](#)

## CLAIMS:

We claim:

1. A process for improving the flowability of spray dried vitamin powders wherein said vitamin powders are comprised of maltodextrin or maltodextrin and sugar carriers, optionally thickeners and densifiers, and low concentrations of vitamins, comprising the steps of:

(a) dissolving said maltodextrin or maltodextrin and sugar carriers and other optional ingredients in an aqueous environment to form a suspension;

(b) adding said low concentrations of vitamins to the suspension formed in step (a);

(c) spray drying said suspension formed in step (b)

(d) coating said spray dried suspension formed in step (c) with hydrophobic silica.

2. A process according to claim 1, wherein said flowability is in the range of 100 to 250.

3. A process according to claim 2, wherein said vitamin is biotin.

4. A process according to claim 3, wherein said low vitamin concentration is 0.1-2%.

5. A process according to claim 4, wherein said maltodextrin is at a level of 96-99.9%.

6. A process according to claim 5, wherein said hydrophobic silica is at a level of 0.5-1%.

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☐ 1. Document ID: US 6303167 B1

Using default format because multiple data bases are involved.

L1: Entry 1 of 7

File: USPT

Oct 16, 2001

US-PAT-NO: 6303167

DOCUMENT-IDENTIFIER: US 6303167 B1

TITLE: Method of producing vitamin powders

DATE-ISSUED: October 16, 2001

INVENTOR-INFORMATION:

| NAME                     | CITY          | STATE | ZIP CODE | COUNTRY |
|--------------------------|---------------|-------|----------|---------|
| Morris; Charles A.       | Overland Park | KS    |          |         |
| Calhoon, Jr.; Francis W. | Olathe        | KS    |          |         |
| Willis; Huey L.          | Raymore       | MO    |          |         |

US-CL-CURRENT: [426/443](#); [424/442](#), [424/489](#), [426/442](#), [426/96](#), [514/458](#)

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|----------------------|-----------------------|--------------------------|-----------------------|------------------------|--------------------------------|----------------------|---------------------------|------------------------|----------------------|-------------------------|

☐ 2. Document ID: US 5714168 A

L1: Entry 2 of 7

File: USPT

Feb 3, 1998

US-PAT-NO: 5714168

DOCUMENT-IDENTIFIER: US 5714168 A

TITLE: Method for increasing flowability of spray dried vitamin powders having low vitamin concentrations

DATE-ISSUED: February 3, 1998

INVENTOR-INFORMATION:

| NAME                 | CITY      | STATE | ZIP CODE | COUNTRY |
|----------------------|-----------|-------|----------|---------|
| Stroh; Friedemann H. | Southgate | MI    |          |         |
| Lisa; Rudolph E.     | Gross Ile | MI    |          |         |

US-CL-CURRENT: [424/490](#); [424/458](#), [424/461](#), [424/479](#), [424/493](#)

|                      |                       |                          |                       |                        |                                |                      |                           |                        |                      |                         |
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|----------------------|-----------------------|--------------------------|-----------------------|------------------------|--------------------------------|----------------------|---------------------------|------------------------|----------------------|-------------------------|

☐ 3. Document ID: US 4486435 A

L1: Entry 3 of 7

File: USPT

Dec 4, 1984

US-PAT-NO: 4486435

DOCUMENT-IDENTIFIER: US 4486435 A

TITLE: Spray-dried vitamin powders using hydrophobic silica

DATE-ISSUED: December 4, 1984

## INVENTOR-INFORMATION:

| NAME                 | CITY       | STATE | ZIP CODE | COUNTRY |
|----------------------|------------|-------|----------|---------|
| Schmidt; Douglass N. | Grosse Ile | MI    |          |         |
| Finnan; Jeffrey L.   | Southgate  | MI    |          |         |
| Lisa; Rudolph E.     | Grosse Ile | MI    |          |         |

US-CL-CURRENT: 514/251, 514/167, 514/276, 514/345, 514/458, 514/474, 514/52,  
514/725, 514/769, 514/770, 514/778

| Full | Title | Citation | Front | Review | Classification | Date | Reference |  |  | Claims | FIGS | Draw D- |
|------|-------|----------|-------|--------|----------------|------|-----------|--|--|--------|------|---------|
|------|-------|----------|-------|--------|----------------|------|-----------|--|--|--------|------|---------|

☐ 4. Document ID: EP 1133279 B1, WO 200027362 A1, AU 200017159 A, EP 1133279 A1, US 6303167 B1, US 20020001622 A1, CN 1332627 A, MX 2001004607 A1, JP 2002529395 W, ZA 200103760 A, NZ 511549 A, AU 769187 B, MX 219745 B

L1: Entry 4 of 7

File: DWPI

Oct 5, 2005

DERWENT-ACC-NO: 2000-376272

DERWENT-WEEK: 200569

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TITLE: Production of dry free-flowing vitamin powder comprises blending redried cornstarch, silica and vitamin, used to promote health

INVENTOR: CALHOON, F W; MORRIS, C A ; WILLIS, H L

PRIORITY-DATA: 1998US-0188166 (November 9, 1998), 2001US-0933709 (August 22, 2001)

## PATENT-FAMILY:

| PUB-NO                   | PUB-DATE           | LANGUAGE | PAGES | MAIN-IPC    |
|--------------------------|--------------------|----------|-------|-------------|
| <u>EP 1133279 B1</u>     | October 5, 2005    | E        | 000   | A61K009/14  |
| <u>WO 200027362 A1</u>   | May 18, 2000       | E        | 013   | A61K009/14  |
| <u>AU 200017159 A</u>    | May 29, 2000       |          | 000   |             |
| <u>EP 1133279 A1</u>     | September 19, 2001 | E        | 000   | A61K009/14  |
| <u>US 6303167 B1</u>     | October 16, 2001   |          | 000   | A61K009/14  |
| <u>US 20020001622 A1</u> | January 3, 2002    |          | 000   | A61K009/14  |
| <u>CN 1332627 A</u>      | January 23, 2002   |          | 000   | A61K009/14  |
| <u>MX 2001004607 A1</u>  | July 1, 2001       |          | 000   | A61K009/14  |
| <u>JP 2002529395 W</u>   | September 10, 2002 |          | 018   | A61K031/355 |

|                       |                  |     |            |
|-----------------------|------------------|-----|------------|
| <u>ZA 200103760 A</u> | October 30, 2002 | 029 | A61K000/00 |
| <u>NZ 511549 A</u>    | August 29, 2003  | 000 | A61K009/14 |
| <u>AU 769187 B</u>    | January 22, 2004 | 000 | A61K009/14 |
| <u>MX 219745 B</u>    | April 6, 2004    | 000 | A61K009/14 |

INT-CL (IPC): A61 K 0/00; A61 K 9/14; A61 K 9/50; A61 K 31/355; A61 K 31/375; A61 K 31/4188; A61 K 31/4415; A61 K 31/506; A61 K 31/519; A61 K 31/59; A61 K 31/7004; A61 K 31/7056; A61 K 47/04; A61 K 47/36; A61 P 3/02

|      |       |          |       |        |                |      |           |  |  |        |      |         |
|------|-------|----------|-------|--------|----------------|------|-----------|--|--|--------|------|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference |  |  | Claims | FIGS | Draw D. |
|------|-------|----------|-------|--------|----------------|------|-----------|--|--|--------|------|---------|

☐ 5. Document ID: US 5714168 A

L1: Entry 5 of 7

File: DWPI

Feb 3, 1998

DERWENT-ACC-NO: 1998-129809

DERWENT-WEEK: 199808

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TITLE: Process for improving flowability of spray dried vitamin powders - by dissolving ingredients to form aqueous suspension, spray drying and coating with hydrophobic silica

INVENTOR: LISA, R E; STROH, F H

PRIORITY-DATA: 1996US-0733231 (December 11, 1996)

PATENT-FAMILY:

| PUB-NO              | PUB-DATE         | LANGUAGE | PAGES | MAIN-IPC   |
|---------------------|------------------|----------|-------|------------|
| <u>US 5714168 A</u> | February 3, 1998 |          | 003   | A61K009/16 |

INT-CL (IPC): A61 K 9/16

|      |       |          |       |        |                |      |           |  |  |        |      |         |
|------|-------|----------|-------|--------|----------------|------|-----------|--|--|--------|------|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference |  |  | Claims | FIGS | Draw D. |
|------|-------|----------|-------|--------|----------------|------|-----------|--|--|--------|------|---------|

☐ 6. Document ID: JP 02016936 A, JP 2631705 B2

L1: Entry 6 of 7

File: DWPI

Jan 19, 1990

DERWENT-ACC-NO: 1990-063590

DERWENT-WEEK: 199733

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TITLE: Blended feed in pellet form for domestic animals - obtd. by kneading vitamin powder, plant pieces and various brans, with zeolite or silica, etc.

PRIORITY-DATA: 1988JP-0167086 (July 5, 1988)

PATENT-FAMILY:

| PUB-NO               | PUB-DATE         | LANGUAGE | PAGES | MAIN-IPC   |
|----------------------|------------------|----------|-------|------------|
| <u>JP 02016936 A</u> | January 19, 1990 |          | 004   |            |
| <u>JP 2631705 B2</u> | July 16, 1997    |          | 003   | A23K001/20 |

INT-CL (IPC): A23K 1/175; A23K 1/20

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | DOC | Draw D |
|------|-------|----------|-------|--------|----------------|------|-----------|--------|-----|--------|
|------|-------|----------|-------|--------|----------------|------|-----------|--------|-----|--------|

☐ 7. Document ID: US 4486435 A, CA 1213829 A

L1: Entry 7 of 7

File: DWPI

Dec 4, 1984

DERWENT-ACC-NO: 1984-318398

DERWENT-WEEK: 198451

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TITLE: Prepn. of spray-dried vitamin powders - includes adding hydrophobic silica while spraying powder into chamber

INVENTOR: FINNAN, J L; LISA, R E ; SCHMIDT, D N

PRIORITY-DATA: 1983US-0494990 (May 16, 1983)

## PATENT-FAMILY:

| PUB-NO       | PUB-DATE          | LANGUAGE | PAGES | MAIN-IPC |
|--------------|-------------------|----------|-------|----------|
| US 4486435 A | December 4, 1984  |          | 005   |          |
| CA 1213829 A | November 12, 1986 |          | 000   |          |

INT-CL (IPC): A61K 9/14; A61K 31/52; A61K 47/00

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | DOC | Draw D |
|------|-------|----------|-------|--------|----------------|------|-----------|--------|-----|--------|
|------|-------|----------|-------|--------|----------------|------|-----------|--------|-----|--------|

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| (vitamin adj1 powder) adj10 silica | 7         |

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US Patents Full-Text Database  
US OCR Full-Text Database  
EPO Abstracts Database  
JPO Abstracts Database  
Derwent World Patents Index  
IBM Technical Disclosure Bulletins

Search:

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Hit Count   Set Name  
result set

*DB=USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR*

L1   (vitamin adj1 powder) adj10 silica

7   L1

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